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Private Bag 3, Wits, 2050, South Africa • Telephone +27 11 717 6682 • esi.research@wits.ac.za
University of the Witwatersrand, Johannesburg

Email: bruce.rubidge@wits.ac.za

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Mr Shane Turner
JMA Consulting (Pty) Ltd
P O Box 883
DELMAS
2210

E-Mail: shane@jmaconsult.co.za

Dear Mr Turner,

Palaeontological Desktop Report – Ferrometals

As requested, herewith a Desktop Palaeontological Impact Assessment with regard to the decommissioning and rehabilitation of the existing northern slimes dam facility at the Ferrometals site, and the construction and operation of a new slimes dam facility, in the eMalahleni Local Municipality, in Mpumalanga Province.

Yours sincerely

Bruce Rubidge PhD, FGSSA, FRSSA, Pr Sci Nat

ESI

**PALAEONTOLOGICAL DESKTOP STUDY
FERROMETALS, EMALAHLENI LOCAL MUNICIPALITY,
MPUMALANGA PROVINCE**

AUTHOR:

Professor Bruce Rubidge
PO Box 85346
Emmarentia

Tel: 072 575 7752

Email: bruce.rubidge@wits.ac.za

COMPILED FOR:

JMA Consulting (Pty) Ltd
P O Box 883
Delmas
2210

Tel No.: 013-665 1788

Cell No: 082 866 4125

Fax No: 013-665 2364

Fax to e-mail: 086 646 9368

Email: shane@jmaconsult.co.za

DATE: 20 March 2014

EXECUTIVE SUMMARY

A desktop Palaeontological Impact Assessment was undertaken at the Samancor Chrome Ferrometals Works situated in Emalahleni (formerly called Witbank), Mpumalanga Province. The development is for the decommissioning and rehabilitation of the existing northern slimes dam facility and the construction and operation of a new slimes dam facility at Ferrometals.

The entire study area is underlain by rocks of the Karoo Supergroup comprising sedimentary rocks of the Carboniferous Dwyka Group and Permian Vryheid Formation of the Ecca Group.

Rocks of the Vryheid Formation contain rich coal deposits which are derived from the famous Permian Glossopteris flora which has Gondwana-wide distribution. As large parts of the proposed development will be on rocks of the Vryheid Formation this has the potential to affect fossil plants.

However, as these fossils are not currently exposed, the development could enhance possibilities to discover plant fossils. If fossils are exposed in the course of the proposed development at Ferrometals, a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented.

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REPORT

Background information of the development

This desktop report is part of a Heritage Impact Assessment to determine the effect that the proposed development of Ferrometals will have on palaeontological heritage. The study was commissioned by JMA Consulting (Pty) Ltd, Delmas.

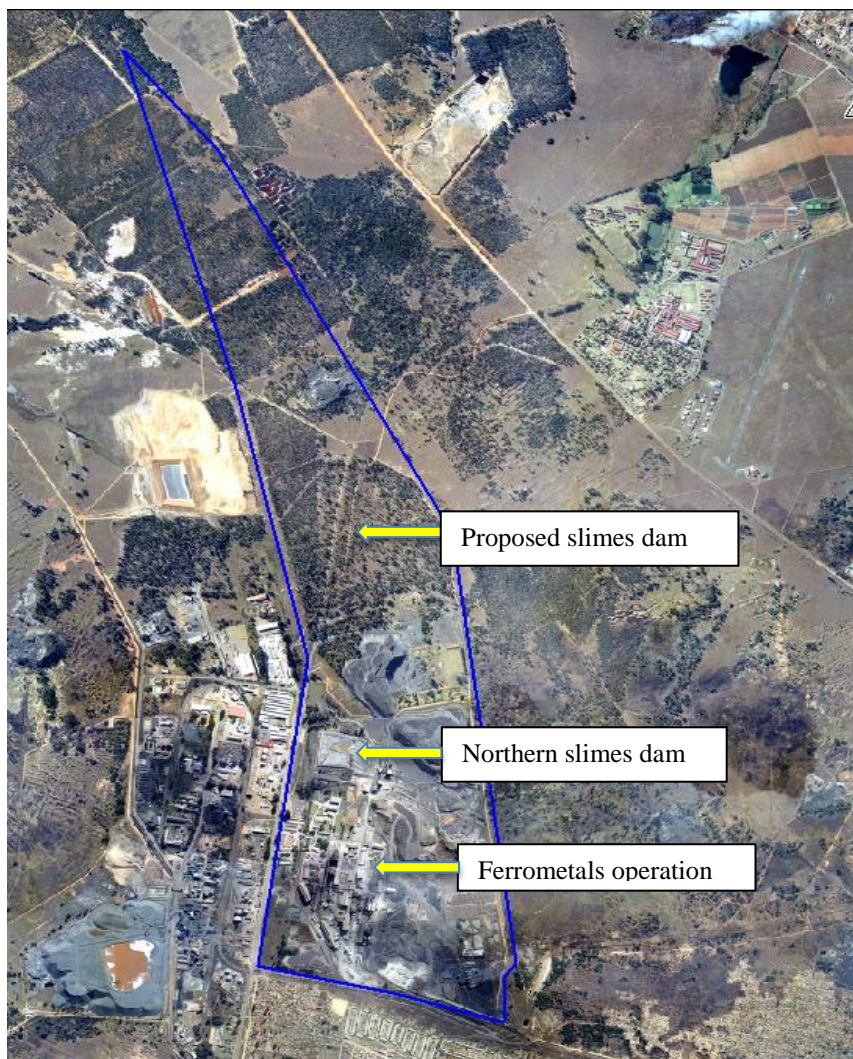


Figure 1: Site Locality of Ferrometals Operations Local showing the positions of the proposed developments.

Ferrometals, a business unit of Samancor Chrome Limited is located within the boundaries of the eMalahleni Local Municipality. The development will occur on Portions 9 and 12 of the Farm Driefontein 297 JS and comprises the decommissioning and rehabilitation of the existing northern slimes dam facility

at the Ferrometals Operation and the construction and operation of a new slimes dam facility at Ferrometals (Figure 1).

Details of the study area

The Ferrometals development area is positioned in eMalahleni Local Municipality within the Springs-Witbank Coalfield of Mpumalanga Province (Figure 2). It is situated on Portions 9 and 12 of the Farm Driefontein 297 JS within the boundaries of the eMalahleni Local Municipality, and is covered by the 1:50 000 topographical map Sheet 2529CC. The current developed portion of the plant site covers about 195 ha and it is expected that the proposed development should not extend below the surface.

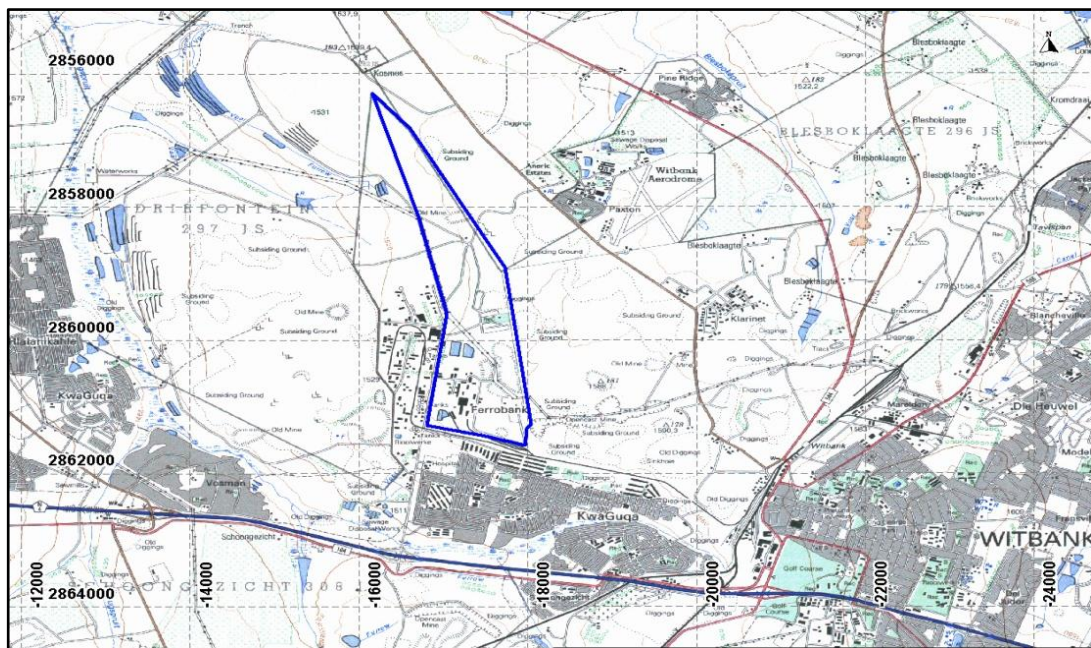


Figure 2: 1:50 000 topographical (Sheet 2529CC) showing the position of the Ferrometals development on portions 9 & 12 of Farm Driefontein 297 JS (outlined in blue)

Geological Setting

The entire study area is underlain by rocks of the Karoo Supergroup comprising sedimentary rocks of the Carboniferous Dwyka Group and the Vryheid Formation of the Permian Ecca Group (Figure 3). The diamictites of the Dwyka Group were deposited in a grounded glacial setting and the mudrocks, coals and

sandstones of the Vryheid Formation were deposited in a delta plain depositional environment.

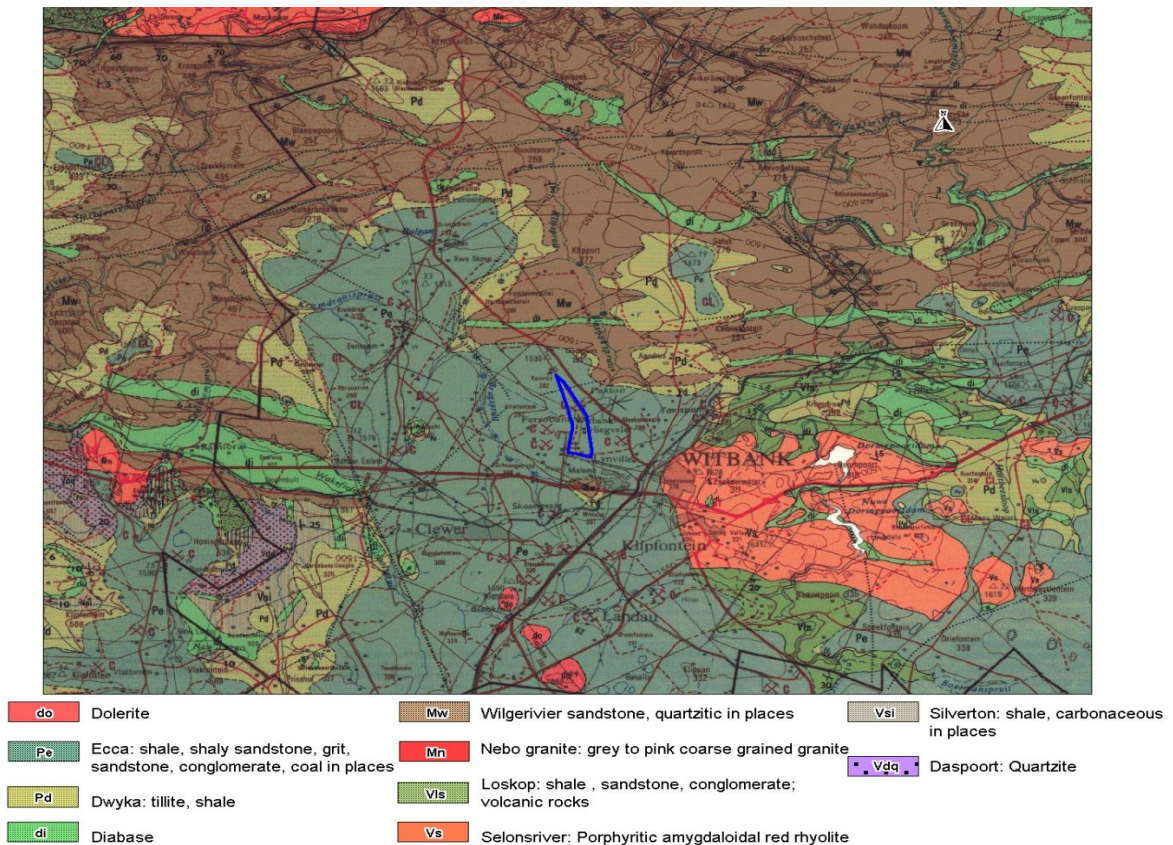


Figure 3: Geological map showing the position of Ferrometals Operations (outlined in blue) in relation to the regional geology.

Palaeontological Heritage

The coarse grained diamictites of the Dwyka Group, which are positioned well below surface in the study area, are unlikely to contain fossils and in any case will not be exposed by the proposed development. The overlying rocks of the Vryheid Formation of the Eccla Group are renowned for their wealth of plant fossils of the famous Gondwanan *Glossopteris* flora which has been described from Permian-aged rocks. This flora is the source of the coal which is mined from the Vryheid Formation in South Africa. Within the Vryheid Formation there are occurrences of well-preserved elements *Glossopteris* flora comprising wood and/or leaves. Large collections of fossil flora from this Formation are present in the collections of the Council for Geoscience in Pretoria and the BPI Palaeontology at the University of the Witwatersrand in Johannesburg.

Recommendation

In the documentation supplied regarding the development it is specifically stated that no disturbances due to Ferrometals activities will occur within the geological sequences underlying the site and that it is unlikely that the underlying geology will influence any Ferrometals activity. As the proposed Ferrometals development will not expose rocks of the Ecca Group it is unlikely that the development will have an impact on palaeontological heritage.

However should the development activities expose extensive outcrops of the Vryheid Formation, it will create a unique opportunity to explore the area for fossils. It is thus recommended that, should fossils be exposed, a qualified palaeontologist be contacted to assess the exposure for fossils before further development takes place so that the necessary rescue operations are implemented. Depending on the nature of the fossils discovered this could entail excavation and removal to a registered palaeontological museum collection. A list of professional palaeontologists is available from South African Heritage Resources Agency (SAHRA).

Conclusion

The proposed development of Ferrometals will cover Carboniferous to Permian-aged sedimentary rocks of the Dwyka and Ecca groups (Vryheid Formation) of the Karoo Supergroup. There is a good possibility that the rocks of the Vryheid Formation in the study area could contain fossil plant material of *Glossopteris* flora. As these fossils are not currently exposed, the development could enhance possibilities to discover plant fossils. If fossils are exposed in the course of the Ferrometals development, a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented.

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